

U.S. Department of Energy Workshop on Standards for Distribution Transformers

Presentations on Utility Impacts Analysis and Environmental Analysis

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UTILITY IMPACTS ANALYSIS

- The Utility Impacts Analysis is designed to estimate the effects of candidate standard levels on electric utilities.
 - In this situation, we mean “utilities” in their role as generators or distributors of energy, not as “consumers” of distribution transformers.

Outline of Proposed Analysis

- *Inputs:* The inputs to this analysis are the annual energy savings that are forecast by the National Energy Savings (NES) analysis.
- *Analysis Model:* The Department proposes to use a version of the Energy Information Administration's (EIA) widely recognized National Energy Modeling System (NEMS).
- *Outputs:* The outputs available from this analysis include end-use electricity sales, utility generation, installed generating capacity, and the distribution of the fuel mix over the forecast period.

NEMS

- NEMS has been developed over several years by EIA, primarily for the purpose of preparing the Annual Energy Outlook (AEO).
- NEMS is available in the public domain.
- NEMS is a large, multi-sector model of the U.S. energy sector.
- NEMS produces a “reference” case, with energy consumption forecasts for the U.S. through 2020.
- The version of NEMS that we use for appliance standards analysis is called NEMS-BRS (for DOE’s Building Research and Standards office).

Method

- To analyze the effect of candidate standard levels, we compare NEMS-BRS output for the various standard levels we're examining with the latest AEO Reference Case.
 - To make this comparison, we first run NEMS-BRS just as it would be run to produce the AEO Reference Case. So, the assumptions we use (e.g., for power plant operating characteristics) will be those used in the latest AEO.
 - Then, we run it with energy use (in the appropriate sector: residential, commercial, or industrial) reduced by the amount of energy (in the case of transformers, electricity) saved due to the candidate standard levels.

Notes

- *Scale of Analysis*: The NEMS model does not allow us to look at the impacts of candidate standard levels on a utility-by-utility basis.
- *Restructuring*: EIA has incorporated the ongoing and expected implementation of utility industry restructuring into its AEO Reference Case. In addition, EIA has developed a scenario where competitive pricing is phased in over 10 years in all regions of the country.

ENVIRONMENTAL ANALYSIS

- The Environmental Analysis is designed to estimate the effect that candidate standard levels would have on reducing environmental emissions.
 - Those reductions in emissions would stem from the reduced operation of power plants, which in turn stem from the reduced consumption of electrical energy due to the candidate standard levels.
- We intend to report on carbon and NO_x emissions reductions from the power sector.

Outline of Proposed Analysis

- *Inputs:* As with the Utility Impacts Analysis, the inputs to this analysis are the annual energy savings that are forecast by the National Energy Savings (NES) analysis.
- *Analysis Model:* As with the Utility Impacts Analysis, the Department proposes to use NEMS-BRS, a version of EIA's NEMS model.
- *Outputs:* The key outputs from this analysis are the levels of carbon and NO_x emissions.
- *Scale of Analysis:* The model does not allow us to look at the impacts of candidate standard levels on a utility-by-utility basis.
- *Environmental issues not treated by NEMS-BRS:* Exogenous analysis would be used to evaluate such issues.